

EVIDENCE-BASED CLINICAL PROTOCOL FOR THE REHABILITATION OF SHOULDER DYSFUNCTION

table of contents

INTRODUCTION	1-1
REHABILITATION PROGRAM CONSIDERATIONS	1-2
DEFINITIONS	1-2
PHASE I: Reduction of Acute Symptoms	
GOALS (to progress to Phase II)	1-3
CLINICAL EVALUATION	1-3
CLINICAL TREATMENT OPTIONS	1-5
SUPERVISED PROGRAM	1-7
HOME PROGRAM	1-8
REPORTS	1-8
PHASE II: Range of Motion and Initial Strengthening	
GOALS (to progress to Phase III)	1-9
CLINICAL EVALUATION	1-9
CLINICAL TREATMENT OPTIONS	1-11
SUPERVISED PROGRAM	1-13
HOME PROGRAM	1-14
REPORTS	1-14
PHASE III: Initial and Intermediate Strengthening	
GOALS (to progress to Phase IV)	1-15
CLINICAL EVALUATION	1-15
CLINICAL TREATMENT OPTIONS	1-17
SUPERVISED PROGRAM	1-20
HOME PROGRAM	1-21
REPORTS	1-22
PHASE IV: Return to Activity	
GOALS	1-23
CLINICAL EVALUATION	1-24
CLINICAL TREATMENT OPTIONS	1-25
SUPERVISED PROGRAM	1-28
HOME PROGRAM	1-29
REPORTS	1-29
REFERENCES:	1-31

INTRODUCTION | clinical protocol

The Information contained in this manual is presented by Biodex Medical Systems as part of our commitment to provide continuing service to medical professionals and to the community at large.

IMPORTANT: READ BEFORE PROCEEDING

Suggested courses of rehabilitation for any specific conditions are meant as references of generalized program models, and are not intended as precise prescriptions for individual treatment. The data is a compilation of information based on the work of acknowledged experts that have been published in respected journals.

We believe it is representative of current trends in scientifically derived and clinically proven principles and methods of rehabilitation medicine. Much of the published information that we review, however, is based on research and case studies involving very specific patient or test subject populations. Many research subjects, for instance, are highly-trained and well-conditioned athletes prior to treatment, or are chosen because they have no known medical problems other than the condition involved in the study. It should therefore be noted that the application of any published methods should be done with extreme care and should be based on sound clinical judgment after thorough evaluation of the individual patient's capabilities, limitations, and overall medical condition. In the presence of any doubt, or question, regarding the efficacy of initiating a procedure, seek advise from appropriate sources and/or consult with the patient's physician.

Note: This protocol is intended as a guide for rehabilitation associated with the conservative management of shoulder dysfunction. Consult the patient's physician prior to incorporating any of the rehabilitation principles listed below.

Please send any comments or concerns to:

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REHABILITATION PROGRAM CONSIDERATIONS

The objective of rehabilitation for the conservative management of shoulder dysfunction, is to quickly and efficiently return the patient to the highest level of pre-injury activity, as is reasonably possible, with minimized risk of increased signs and symptoms, related complications, or predisposing the patient to re-injury. This program can be used as a preventative measure or as an injury treatment program.

Prior to the rehabilitation of the patient with shoulder dysfunction, there are five common factors of functional assessment. It is imperative that the clinician understands the patient's goals and physiologic make-up prior to beginning the rehabilitation process. The five factors referred to in the literature are:

1. Severity of injury
2. Tissue damage and involvement
3. Tissue status of patient
4. Neuromuscular control
 - Efficiency of force couples
5. Desired activity level
 - Overhead activities
 - Below shoulder activities

DEFINITIONS:

Goals: Specific improvements which must be met in order for patient to progress to next phase.

Clinical Evaluation: Evaluations that are only to be performed by certified and/or licensed PT, OT or ATC, in association with supervising physician's diagnosis.

Clinical Treatment Options: Treatment options that should only be performed under the supervision of certified and/or licensed clinicians.

Supervised Program: Rehabilitation program that should be done only under the direction of appropriately qualified personnel (e.g. Certified Strength and Conditioning Specialist).

Home Program: Rehabilitation program that after proper instruction by supervising clinician, can be done by patient without supervision.

Reports: Test reports are to be completed at the end of each phase to ensure progress to the next phase is indicated.

PHASE I | reduction of acute symptoms

GOALS:

- Mentally prepare patient for rehabilitation
- Education of patient to understand the problems of shoulder dysfunction
- Identify specific needs of the patient and potential problems
- Decrease pain and inflammation
- Maintain wrist and elbow Range of Motion (ROM) and strength
- Develop voluntary and involuntary control of shoulder stabilizers
- Correct biomechanical faults
- Identify contributory factors
- Increase shoulder strength and prevent disuse atrophy
- Regain full pain free Passive Range of Motion (PROM) of involved shoulder in all directions
- Proprioception: ER < 40% deficit bilaterally
- Isometric strength: < 50% deficit bilaterally for all directions

CLINICAL EVALUATION:

- General patient history and observation:
 - To assist in the rehabilitation process, the clinician/physician should complete a thorough subjective evaluation of mechanism of injury. This will allow the clinician to design strategies to correct the pathology through operative and/or non-operative means. ⁴
 - Muscle atrophy
 - Scapular winging (scapular slide test) ¹⁰
- Visual Pain scale: ¹⁵
 - Location, quality, duration, and intensity
- Edema: degree and character of swelling
- Musculoskeletal evaluation ¹²
- Range of Motion (ROM):
 - Involved extremity (PROM)
 - Uninvolved extremity (AROM / PROM)
- Special Tests:
 - Shoulder instability tests ²²
 - Apprehension:
 - Apply's scratch, anterior / posterior drawer, relocation test, etc.
 - Shoulder impingement tests:
 - Empty can, Hawkins, Neer, Speeds, etc.
 - Glenoid labral tests:
 - Clunk, O'Brien, Anterior slide tests ³

CLINICAL EVALUATION (cont):

- Neurological assessment:
Myotomes, Dermatomes and Reflexes for C-3 to T-2
- Scapulohumeral Rhythm:
For each 15° of shoulder abduction, 10° is at the glenohumeral joint and 5° is at the scapulothoracic joint.

TEST: Bilateral Isometric comparison ER/IR modified neutral:

NOTE: Must have non-painful contractions and the decision to test supported by clinical judgment.

Device: Biodex Multi-Joint System

Pattern: Shoulder ER/IR modified neutral

Report: Bilateral isometric comparison

Setup: Neutral rotation/plane of the scapula

Mode: Isometric

Duration: 5 seconds

Sets and Reps: 1 x 5 reps

Rest between repetitions: 10 seconds

Recommendations: Have the patient perform the test with as maximal tolerable effort as possible. Use pain and substitution as a guide.

CLINICAL TREATMENT OPTIONS:

- Rehabilitation process education:
 - Clinic familiarization (for patient and family)
 - Rehabilitation
 - Psychological preparation
 - compliance
 - expectations
 - precautions
- Reduce spasm, pain and edema:
 - Protect, Rest, Ice, Compression and Elevation (P.R.I.C.E.)
 - TENS for pain and spasm control
- Manual Grade I oscillations: ¹⁷
 - To decrease pain and keep the capsule free from adhesions.
- Range of Motion (ROM) exercises:
 - Following acute injury, the initial program should be to restore motion to the shoulder as pain free as possible. ⁸
 - Pendulum swings (non weighted) ⁹
 - Sets and Reps: 2 x 25
 - Recommendations: Perform one set of clockwise and counterclockwise (CW/CCW), flexion and extension (FLEX/EXT), and horizontal abduction and adduction (Horiz ABD/ADD). Ensure that the shoulder is relaxed during rotations.

 - Wall walking
 - Pattern: Abduction and Flexion (ABD + FLEX)
 - Sets and Reps: 2 x 15 each pattern
 - Recommendations: Use pain as a guide. If impingement exists, stay below shoulder height.

 - Active assist T-bar exercises (FLEX and IR in neutral or plane of the scapula)
 - Sets and Reps: 2 x 15
 - Recommendation: Use pain as a guide. The use of a transfer belt is recommended around the chest and scapula to prevent scapular winging.

 - Device: Biodex Multi-Joint System
 - Pattern: shoulder IR/ER and shoulder FLEX/EXT
 - Setup: Shoulder abduction to 40° flexion to 30°; elbow flexion 90° ⁸
 - Mode: Passive
 - Duration: 15-20 min as tolerated
 - Speed: Begin at 10 deg/sec and progress as tolerated
 - Recommendations: Instruct patient to produce no force. Begin with ROM percent dials at 50% for IR/ER. Determine pain free ROM by the gradual adjustment of dials.
- Posture control:
 - Generally recommended, but has not demonstrated any correlation to shoulder injury ¹⁴
 - Gentle shoulder shrugs (caution on the eccentric phase)
 - Scapular retraction

CLINICAL TREATMENT OPTIONS (cont):

- Open Kinetic Chain (OKC) Proprioception:

Device: Biodex Multi-Joint System

Passive, Active and Threshold to detect passive movement*

Pattern: ER/IR modified neutral

Mode: Passive and Isokinetic

Sets and Reps: 3 x 5 each target angle

Target Angle: ROM dependent (see recommendations)

Recommendations: Be cautious with the target angle selected. There should be NO incidence of pain or inhibition.

***NOTE:** Threshold to detect passive movement for System 2 users with 4.5 or 4.6 software

Manual Proprioceptive Neuromuscular Facilitation (PNF) Patterns

Pattern: D1 and D2*

Sets and Reps: 2 x 10 each pattern (progress to 3 sets of 12 reps)

Recommendations: Each pattern should be done within the comfort level of the patient, within the pain-free range of motion.

***NOTE:** Each pattern should be indicated by clinical findings. Not every pathology allows for the pain-free movement of each pattern.

Device: Biodex Closed Chain Attachment

Pattern: Scapular retractors²⁴

Setup: Begin with shoulder flexion at 70° and progress to 90° when there are no signs of impingement

Mode: Passive

Sets and Reps: 2 x 15

Speed: 10 deg/sec

Recommendations: Have the patient perform sub-maximal retraction eccentrics. Utilize the torque limits to limit maximal torque at 10ft/lb. A belt can be used around the chest to limit excessive trunk motion.

Device: Cable Column

Pattern: elbow FLEX/EXT with arm at side

Setup: unilateral single hand grip at bottom of cable column

Sets and Reps: 3 x 8-10

Weight: Begin with 1 plate and progress at tolerated

Scapulothoracic neuromuscular control exercises³⁵

Side-lying scapular retraction, elevation, and depression

Sets and Reps: 3 x 10-12

Recommendations: Increase the amount of repetitions as needed

- Cardiovascular training:

Device: Biodex Upper Body Cycle

Setup: Actuator tilt so the shoulder is flexed below 90° (no pain)

Duration: Begin with 3 min and progress to 5 min by end of phase

Speed: 120 deg/sec

Recommendations: Ensure that glenohumeral motion is limited below 90° of shoulder flexion

Device: Biodex BioStep® Semi-Recumbent Elliptical

Setup: Seat height adjusted so knee is at 10° in full extension

Duration: Begin with 10 min and progress to 15 min end of the phase

Speed: 90-120 deg/sec

Device: Biodex Rehabilitation Treadmill

Setup: 0% incline

Duration: Begin with 5-10 min and progress as tolerated

Speed: Begin walking (3mph) and progress as tolerated

Recommendations: Monitor levels of intensity and progress as tolerated

***NOTE:** Swinging the arms during ambulation has been shown to increase the firing of the rotator cuff musculature.

SUPERVISED PROGRAM:

- Control edema and manage pain:
P.R.I.C.E.
- Strengthening:
 - Shoulder FLEX/EXT, ER/IR and ABD/ADD Isometrics
Sets and Reps: 1 x 10
Contraction duration: 6 seconds
Recommendation: Utilize doorway to perform exercises. All exercises should be performed in the scapular plane.
 - Elbow flexion and extension (isotonics)
Sets and Reps: 3 x 15
Weight: Begin with 1-2 plates and progress as tolerated
 - Wrist FLEX/EXT and Supination/Pronation
Sets and Reps: 3 x 15
Weight: Begin with 1-2 pounds and progress as tolerated
- Scapular exercises:
 - Shrugs, retraction, scaption, shoulder rows, and prone extension
Sets and Reps: 3 x 15
Weight: Begin with weight used at end of last phase
- Shoulder isotonics:
 - ABD/ADD in scapular plane, bench press motion in scapular plane, reverse rows
Sets and Reps: 3 x 15
Weight: Begin with no weight and progress as tolerated
- Proprioception:
 - Quadruped closed chain
Sets: 1-2
Duration: 30 seconds
Recommendations: Have patient axially load the Glenohumeral joint to increase stability and proprioceptive abilities.
- Flexibility training:²⁸
 - Shoulder bar (FLEX to 80°, ER in modified neutral to 45°, IR)
Sets and Reps: 1 x 5-6
Duration of hold: 20 seconds
- Cardiovascular training:
 - Device: Biodex Upper Body Cycle (only if patient can cycle below 90° of shoulder flexion)
Duration: Begin at 3 min and progress to 15 min
Speed: 120 deg/sec
Recommendations: Ensure that shoulder is below 90° of shoulder flexion
 - Device: BioStep® Semi-Recumbent Elliptical
Duration: Start with 10 min and progress to 15 min
Speed: 90-120 deg/sec

HOME PROGRAM:

- Control pain and swelling:
(P.R.I.C.E.)
- Range of Motion (ROM) exercises:
 - Shoulder T-bar
 - Shoulder flexion to 90°
 - ER/IR in at modified neutral
 - Sets and Reps: 1 x 15
 - Duration of hold: 5 seconds

 - Pendulum swings
 - Shoulder FLEX/EXT horizontal ABD/ADD, and CW/CCW
 - Weight: Begin with no weight and progress as tolerated
 - Sets and Reps: 2 x 25 each direction
 - Times daily: 4-5
 - Recommendations: The exercise should be performed in a relaxed state. Do not have the patient "actively" swing the arm.
- Strengthening:
 - Shoulder ER/IR isometrics
 - Setup: Standing with towel roll under axilla
 - Sets and Reps: 2 x 15
 - Contraction duration: 2 seconds
 - Recommendation: Utilize doorway to perform exercises. Exercises should be performed in the scapular plane. Use pain as a guide for effort.

 - Shoulder FLEX/EXT and ABD/ADD Isometrics
 - Setup: Standing
 - Sets and Reps: 2 x 15
 - Contraction duration: 2 seconds
 - Recommendation: Utilize doorway to perform exercises. Exercises should be performed in straight plane. Use pain as a guide for effort.

 - Elbow FLEX/EXT Isotonics
 - Sets and Reps: 3 x 15
 - Weight: Begin with 2 pound and progress as tolerated

 - Wrist FLEX/EXT and Pron/Sup Isotonics
 - Sets and Reps: 3 x 15
 - Weight: Begin with 2 pounds and progress as tolerated
- Cardiovascular training:
 - Device: Biodex Rehabilitation Treadmill
 - Intensity: 65-80% MHR for 20 mins. 3-4 times a week

REPORTS:

- Passive and Active Range of Motion:
FLEX/EXT, ER/IR and ABD/ADD
- Pain scale
- Level of cardiovascular fitness:
Establish: distance traveled, speed attained and duration of exercise
- Biodex bilateral proprioception for ER/IR in modified neutral
- Biodex bilateral isometric comparison for FLEX/EXT, ER/IR modified neutral and ABD/ADD

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。如要下载或阅读全文，请访问：<https://d.book118.com/745112104331011033>